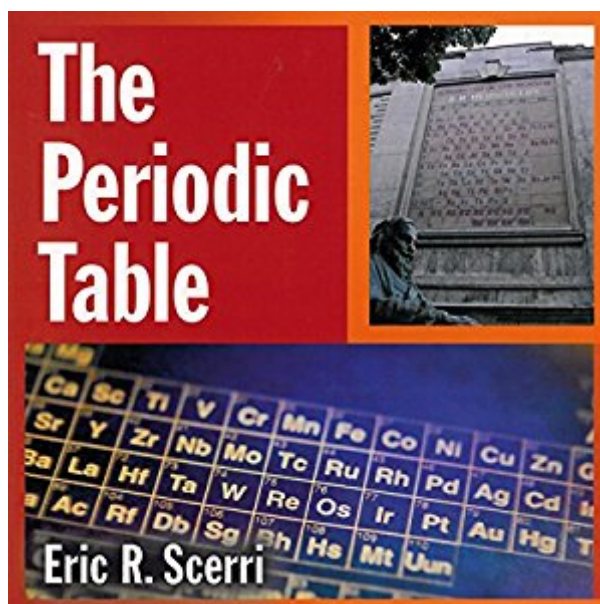


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The Periodic Table: Its Story And Its Significance



Synopsis

The periodic table is one of the most potent icons in science. It lies at the core of chemistry and embodies the most fundamental principles of the field. The one definitive text on the development of the periodic table by van Spronsen (1969), has been out of print for a considerable time. The present book provides a successor to van Spronsen, but goes further in giving an evaluation of the extent to which modern physics has, or has not, explained the periodic system. The Periodic Table is written in a lively style to appeal to experts and interested lay-persons alike. It begins with an overview of the importance of the periodic table and of the elements and it examines the manner in which the term "element" has been interpreted by chemists and philosophers. The book then turns to a systematic account of the early developments that led to the classification of the elements, including the work of Lavoisier, Boyle, and Dalton and Cannizzaro. The precursors to the periodic system, like Dobereiner and Gmelin, are discussed. In chapter 3 the discovery of the periodic system by six independent scientists is examined in detail. Two chapters are devoted to the discoveries of Mendeleev, the leading discoverer, including his predictions of new elements and his accommodation of already existing elements. Chapters 6 and 7 consider the impact of physics, including the discoveries of radioactivity and isotopy and successive theories of the electron, including Bohr's quantum theoretical approach. Chapter 8 discusses the response to the new physical theories by chemists, such as Lewis and Bury, who were able to draw on detailed chemical knowledge to correct some of the early electronic configurations published by Bohr and others. Chapter 9 provides a critical analysis of the extent to which modern quantum mechanics is, or is not, able to explain the periodic system from first principles. Finally, chapter 10 considers the way that the elements evolved following the Big Bang and in the interior of stars. The book closes with an examination of further chemical aspects, including lesser known trends within the periodic system, such as the knight's move relationship and secondary periodicity, as well as attempts to explain such trends.

Book Information

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Customer Reviews

XXXXX "In spite of the central...role of the periodic table [of the elements], very few authors have felt drawn to write books on its evolution. There is no book that deals adequately with the historical, and especially the conceptual, aspects of the periodic system [that holds that there is a fundamental relationship among the elements] or its significance in chemistry and science generally. It is with the aim of injecting a more philosophical treatment to understanding the periodic system that [this book] has been undertaken...this book is not intended as a work of historical scholarship...the reader is [taken] on an interdisciplinary tour of the many areas of science that are connected with the periodic system, including physics, mathematics, computational methods, history and philosophy of science, and of course, chemistry." The above is found in the introduction to this fascinating, extremely well researched book by Dr. Eric Scerri, a professor of chemistry and history & philosophy of science at UCLA. This book is fittingly dedicated to the 100TH anniversary of the death of Dimitri Mendeleev (1834 to 1907). The periodic table of the elements--what is it? Simply, it is basically a two-dimensional representation of a periodic system (that is explained above). The aim of this book is to bring the story of the periodic table "up to date." This book from my own personal perspective can roughly be divided into five parts: (I) An overview of the periodic system. (1 chapter) (II) The development of the periodic table.

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